

Institutional Development Award (IDeA) Program
IDeA NETWORKS OF BIOMEDICAL RESEARCH EXCELLENCE (INBRE)
Directory of Active Awards by State
July 2006

<u>Alaska</u>	<u>Idaho</u>	<u>Maine</u>	<u>Nevada</u>	<u>Puerto Rico</u>	<u>Vermont</u>
<u>Arkansas</u>	<u>Kansas</u>	<u>Mississippi</u>	<u>New Mexico</u>	<u>Rhode Island</u>	<u>West Virginia</u>
<u>Delaware</u>	<u>Kentucky</u>	<u>Montana</u>	<u>North Dakota</u>	<u>South Carolina</u>	<u>Wyoming</u>
<u>Hawaii</u>	<u>Louisiana</u>	<u>Nebraska</u>	<u>Oklahoma</u>	<u>South Dakota</u>	

Alaska

Contaminants and Infectious Agents: Molecular Approaches **University of Alaska, Fairbanks - P20 RR016466**

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Partner Institution

University of Alaska, Anchorage

Outreach Institutions

University of Alaska Southeast, Juneau
College of Rural Alaska, Fairbanks
Alaska Pacific University, Anchorage
Sheldon Jackson College, Sitka

Program Goals

- Enlarge and sustain an inter-campus network for environmental health research
- Focus on molecular toxicology of subsistence species, infectious agents, and zoonotic diseases
- Support research projects of junior faculty, postdoctoral research associates, and graduate students
- Provide research opportunities for undergraduate students throughout Alaska
- Provide outreach activities to students and teachers at smaller colleges in Alaska, health corporations, hospitals, and other organizations at rural sites
- Enhance science knowledge of the Alaskan workforce and expand the undergraduate student pipeline into health careers, with particular attention to Alaska Native students
- Form a core research team consisting of seven recently recruited faculty members
- Recruit two new faculty positions
- Feature bioinformatics as an integral part of the program

Research Projects

- Role of caveolin-1 in AH-R signal transduction
- Structural and functional features of the 5-HT3R binding site
- Essential and non-essential element bioavailability from subsistence foods in an Arctic fox model
- The epidemiology of hepatocellular carcinoma (HCC) and end-stage liver disease in Native Alaskans who are carriers of hepatitis B virus (HBV)
- Algorithms to understand the evolution of complex loci

- A portable and extensible system for genome data management and analysis
- Bacterial replication within cells of vectors
- Biology and genetics of avian influenza in wild birds
- Evolution of the major histocompatibility complex in a natural model

Resources

- DNA core laboratory
- Biomedical computer science facility
- Central animal facility
- Scanning electron microscope facility
- Public health laboratory
- Applied science and engineering technology laboratory
- Ecosystem and biomedical health facility

Index Terms

molecular toxicology, infectious agents, zoonotic diseases, minority outreach, public health, rural health care, environmental biology, bioinformatics, dioxin, hepatitis B, cancer, liver disease, epidemiology, minority education

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Arkansas

Partnerships for Biomedical Research in Arkansas

University of Arkansas for Medical Sciences - P20 RR016460

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Lead Institutions

University of Arkansas for Medical Sciences
University of Arkansas
University of Arkansas at Little Rock

Partner Institutions

Arkansas State University
Hendrix College
John Brown University
Lyon College
Ouachita Baptist College
University of Arkansas at Pine Bluff
University of Central Arkansas

Outreach Institutions

Arkansas Tech University
Central Baptist College
Harding University
Henderson State University
Philander Smith College
University of Arkansas at Monticello

Program Goals

- Expand and strengthen the biomedical research infrastructure of the lead and partner institutions by developing a multidisciplinary research network united by the scientific theme of *Cellular Signaling, Growth, and Differentiation*
- Increase the biomedical research base in Arkansas by providing research support to select faculty at the Arkansas INBRE partner undergraduate institutions (UGIs) so they can obtain independent extramural funding for their biomedical research projects
- Provide research opportunities for undergraduate students from the seven partner UGIs, thereby serving as a “pipeline” for students to choose health research careers

- Sponsor specialized outreach activities for faculty and students from UGIs other than the seven partner UGIs, thereby preparing other investigators for future INBRE support
- Enhance the science and technology base of Arkansas's future workforce by developing a cadre of trained scientists – especially those with expertise in biomedical research and bioinformatics – and provide resources to stimulate growth of biotechnology industries in Arkansas

Research Projects

- Effects of nicotine on processes mediated by the reticular activating system
- Cholinergic mechanisms in neuronal regeneration
- The role of bone morphogenetic proteins in nociceptive neuron development
- Transcriptional regulation of the myelin proteolipid protein gene: effect of intron 1-binding factors on chromatin remodeling during oligodendrocyte differentiation
- Signaling by non-classical ligands of estrogen receptor: novel approaches to detection and mechanism
- Translational regulation during *Xenopus* oocyte development
- Molecular mechanisms contributing to gender disparity in multiple sclerosis
- p107 function in 3T3-L1 differentiation
- Assessment of drug uptake and permeability properties of novel anticancer agents in the brain
- The effect of c-Myc expression on the activation of the gastrin promoter
- Effects of adverse neonatal experience on cortical subplate neurons
- Interaction of aging and estradiol metabolites on coronary arterial function
- Role of Ascorbate in Coordinating Growth and Senescence in *Arabidopsis thaliana*

Resources

- Genomics facility
- UAMS proteomics facility
- UAF proteomics facility
- Microscopy facility
- UAMS bioinformatics center
- UALR bioinformatics center

Index Terms

cancer, cell signaling, cell biology, genomics, microarray, proteomics, microscopy, bioinformatics, neurobiology, developmental biology

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Delaware

IDeA Network for Biomedical Research Excellence

Delaware Biotechnology Institute, University of Delaware, Newark - P20 RR016472

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Partner Institutions

Delaware State University, Dover
Christiana Care Health Services, Newark
Nemours / A.I. duPont Hospital for Children, Wilmington
Wesley College, Dover

Outreach Institutions

Delaware Technical & Community College, Stanton
University of Delaware School of Nursing, Newark

Program Goals

- Develop junior and early-career faculty in Delaware through mentored biomedical research
- Enlarge the pool of individuals and teams of researchers who can compete successfully for NIH grants
- Strengthen the existing biomedical research infrastructure
- Engage all levels of research potential, including undergraduate students, graduate students, post-doctoral associates, faculty, nurses, medical interns, and medical research personnel through improved biomedical workforce development
- Strengthen the network of academic and medical institutions of higher learning across the state and foster an emerging medical research initiative in the Delaware health care system
- Develop research themes in cancer, biomedical imaging, animal modeling, infectious diseases and biochemistry
- Establish an outreach program with internships, personnel exchanges, education and training programs, seminars, and other activities at outreach partner institutions

Research Projects

- Electrospun collagen scaffolds for development of 3-D cellular models for testing anti-neoplastic agents
- Autocrine stimulation of primary and metastatic brain cancer cells
- Proteomic analysis of apoptotic mechanisms in cancer
- Nanotechnology for cancer detection and therapeutics
- Role of IGFBP-2 fragments in development of androgen insensitive prostate cancer

- 3-D image analysis algorithms for automatic computation of ground glass opacity of lung tumors
- Analysis of 3-D breast surface deformation during mammographic compression
- Hepatic lipid metabolism and gene expression in hen
- Characterization of surfactant protein expression in avian lung as a model for upper respiratory disease in humans
- Investigating the neurobiology of sensory processing and learning in an invertebrate model system
- RNA cap hypermethylases in Microsporidia
- Genetic diversity in *Borrelia burgdorferi*
- Distribution of Lyme Disease and other tick-borne diseases in Delaware
- Extent of nucleophilic participation in acyl, sulfonyl and sulfamoyl halides

Resources

- Bioimaging core center
- Bioinformatics core center
- Cellular proteomics core facility
- Custom microarray facility
- DNA sequencing core facility
- Embryonic mouse stem cell culture core facility
- Greenhouse facilities
- Mass spectrometry core facility
- Nuclear magnetic resonance core facility
- Protein production core facility
- Transgenic/chimeric mouse core facility

Index Terms

biomedical translation, bioinformatics, biotechnology, computation, cancer, colorectal cancer, breast cancer, imaging, 3-D reconstruction, public health, minority education, uterine fibroids, prostate cancer, bone cancer, bioengineering, biosensors, neuromuscular disease, lung cancer, fungal diseases, drug delivery system, drug synthesis, vaccine synthesis, transgenic plants, cell signaling, retrovirus, immune response, virtual surgery, Lyme disease, bioconversion, infectious diseases, women's health, anti-neoplastic agents, glioblastoma, neuroblastoma, tumor detection, prostate tumors, mammography, cardiovascular disease, microsporidia, biomedical imaging, biochemistry

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Hawaii

Cellular Basis of Immunological and Neurological Disease

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Partner Institutions

Chaminade University, Honolulu
Hawaii Pacific University, Kaneohe
University of Hawaii, Hilo
Queen's Medical Center, Honolulu

Outreach Institutions

Kapiolani Community College, Honolulu
Windward Community College, Kaneohe
Hawaii Community College, Hilo
Leeward Community College, Pearl City

Program Goals

- Expand and develop competitive research capacity in Hawaii by building on the institutional network foundation begun under BRIN
- Develop multi-disciplinary research projects that explore the cellular basis of immunological and neurological diseases
- Develop core competencies in immunology, cell biology, and developmental biology
- Establish teams consisting of a senior mentor investigator, junior investigators at the lead and affiliated institutions, and graduate and undergraduate students
- Provide outreach activities to undergraduate institutions and community colleges
- Foster the development of individual careers and of institutional research capacity
- Sponsor training and mentoring workshops and seminars
- Provide academic work force development through bioinformatics core training activities
- Enhance the science and technology knowledge of Hawaii's workforce

Research Projects

- Analysis of the regulation of TERT expression in murine primordial germ cells
- Transposon targeted integration (to produce transgenic animals)
- Mitochondrial mechanism in HIV neuropathy
- Endocrine disruptor accumulation in rural Hawaii food harvesters

- Inhibitors of mast cell degranulation and TRPB cation channels from marine organisms
- Comparative respiratory irritancy of oxidant and sulfur oxide air pollutants

Resources

- Bioinformatics core facility
- Biological electron microscopy facility
- Molecular biology core facility
- Vivarium
- Tissue culture facilities
- Laboratory of molecular medicine and infectious diseases
- Retrovirology research laboratory
- Genomic research core facility

Index Terms

immunology, cell biology, developmental biology, neurobiology, cell signaling, imaging, molecular biology, genomics, proteomics, HIV, cancer, aging, infertility, neuropathy, dementia, forensics, toxicology, physical anthropology, addiction, nicotine, inflammatory diseases, asthma, arthritis, air pollutants, ozone

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Idaho

Idaho INBRE Program

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Partner Institutions

Idaho State University, Pocatello
Boise State University, Boise
Albertson College of Idaho, Caldwell
Boise Veterans Administration Medical Center, Boise
Northwest Nazarene University, Nampa
Mountain States Tumor and Medical Research Institute, Boise

Outreach Institutions

Brigham Young University - Idaho, Rexberg
College of Southern Idaho, Twin Falls
Eastern Idaho Technical College, Idaho Falls
Lewis-Clark State College, Lewiston
North Idaho College, Coeur d'Alene

Program Goals

- Continue to build an interdisciplinary multi-institutional research network within the theme of cell signaling
- Support a network of research partners consisting of colleges with developing research missions to enhance the research base
- Maintain an educational pipeline through college and graduate school that offers progressively greater research experiences at each level
- Enhance educational outreach activities at undergraduate colleges
- Create an educated workforce that will sustain a developing biomedical industry in Idaho
- Develop bioinformatics resources as research and teaching tools

Research Projects

- Structure/function analysis of anthracycline reduction by human carbonyl reductase
- Oncostatin M induces VEGF in human breast carcinoma cells: stimulation of angiogenesis *in vitro* and *in vivo*
- Involvement of astrocyte caspase activation and CD40/CD40L interactions in Alzheimer's Disease (with three subprojects)

- Molecular interactions of the pericellular matrix
- Cadmium chelation therapy: development of new agents to prevent/treat heavy metal poisoning
- Investigating differential cell sensitivity to cadmium and cadmium-sequestering molecules
- Distribution of flux control between ADH and ALDH in liver ethanol metabolism (with three subprojects)

Resources

- Microarray core facility
- Molecular biology core facility
- Proteomics core laboratory
- DNA sequencing laboratory
- Bioinformatics facility
- Molecular ecology and genomics core laboratory
- Confocal imaging center
- Cell culture and processing laboratory

Index Terms

cell signaling, bioinformatics, Internet2, cancer, breast cancer, Alzheimer's disease, metal poisoning, alcohol metabolism, alcoholism, prostate cancer, anti-cancer drug toxicity, neurodegeneration, inflammation, bone, cartilage, drug design

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Kansas

Kansas IDeA Network of Biomedical Research Excellence University of Kansas Medical Center, Kansas City - P20 RR016475

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Partner Institutions

University of Kansas, Lawrence
Kansas State University, Manhattan
Wichita State University, Wichita

Outreach Institutions

Emporia State University, Emporia
Fort Hays State University, Hays
Haskell Indian Nations University, Lawrence
Pittsburg State University, Pittsburg
Washburn University, Topeka
Langston University, Langston

Program Goals

- Build, strengthen, and integrate biomedical research in Kansas
- Establish a multidisciplinary research network with a thematic research focus in cell and developmental biology
- Provide support to junior faculty at the participating institutions; highlight four investigators each year for career guidance and research support
- Increase the workforce of biomedical researchers in Kansas by delivering special services tailored to the needs of the outreach institutions
- Enhance science and technology knowledge of the Kansas workforce
- Provide analytic and interpretive programs and services in bioinformatics
- Develop new strategies for improving human health

Research Projects

- Regulation of apoptosis in the *Drosophila* retina
- Role of Caspase-2 in skin cancer prevention
- Analysis of mechanisms that partition dsRNAs to daughter cells following mitosis/meiosis
- Mechanisms of dorsoventral patterning during neural development

Resources

- Bioinformatics core facility
- Imaging core facility
- Teleresearch equipment facility
- Biobehavioral measurement core facility
- Microarray core facility
- Biotech support facility
- Confocal microscopy facility
- Transgenic mouse facility

Index Terms

cell biology, developmental biology, genomics, proteomics, lipidomics, cancer, eyes, skin
cancer, nervous system, minority education, reproductive biology

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Kentucky

KY-IDeA Networks of Biomedical Research Excellence University of Louisville, Louisville - P20 RR016481

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Partner Institutions

University of Kentucky, Lexington
Eastern Kentucky University, Richmond
Morehead State University, Morehead
Northern Kentucky University, Highland Heights
Western Kentucky University, Bowling Green

Outreach Institutions

Kentucky State University, Frankfort
Murray State University, Murray
Bellarmine University, Louisville
Berea College, Berea
Pikeville College, Pikeville
Transylvania University, Lexington
Kentucky Wesleyan College, Owensboro

Program Goals

- Continue to develop infrastructure and a network of biomedical researchers to increase the capacity for research in Kentucky
- Build a research core to provide eleven researchers with the motivation and support needed to become competitive for independent federal funding
- Nurture research within the themes of genomics and neuroscience
- Develop core research facilities in genomics and bioinformatics
- Provide summer research opportunities for undergraduate students in all affiliated institutions to develop the pipeline of students entering educational tracks toward careers in biomedical research

Research Projects

- Genetic and metabolic adaptation by *Salmonella* to the natural environment
- Antipsychotic drug action after hippocampal damage
- Characterization of putative magnesium transporting P-type ATPases
- Structural and functional recovery of auditory hair cells in zebrafish

- RNA-based mechanisms of transcription elongation control
- A butterfly transposon mutagenesis screen for the study of wingless signal transduction
- Mechanisms of transcriptional coordination among phosphorylase kinase genes
- Amphetamine-induced acute withdrawal/reversible depression in rats
- Molecular mechanisms of estrogen-regulated bone resorption
- QSAR of adrenergic receptor antagonist
- Functional and molecular analysis of long-term sleep disruption by ethanol

Resources

- Digital microscopy core facility
- Bioinformatics core facility
- Genomics centralized facility
- Proteomics core facility

Index Terms

neuroscience, genomics, molecular biology, bioinformatics, genetics, bacteria, *Salmonella*, antipsychotic drugs, brain damage, Alzheimer's disease, schizophrenia, memory loss, cardiovascular disease, diabetes, asthma, evolution, vision, eyes, retina, metabolic regulation, cancer, anti-cancer drugs, drug addiction, estrogens, osteoporosis, aging, taste, neurological development, women's health

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Louisiana

Louisiana Biomedical Research Network

Louisiana State University, Baton Rouge - P20 RR016456

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Partner Institutions

Louisiana State University Health Sciences Center, New Orleans
Louisiana State University, Shreveport
Louisiana Tech University
Southern University and A&M College
The University of Louisiana at Monroe

Outreach Institutions

Centenary College of Louisiana
Grambling State University
Nicholls State University
Southern University at New Orleans
Xavier University of New Orleans

Program Goals

- Establish a research network supporting interdisciplinary biomedical research
- Support specific research projects led by investigators from participating institutions and mentored by experienced biomedical scientists
- Generate a critical mass of biomedical investigators at each participating PUI campus through support of mentored research projects, and enhanced communication and collaboration with established research laboratories and facilities
- Support biomedical research and education throughout Louisiana by providing outreach opportunities for students and faculty from all colleges and universities within the state that are not INBRE partner institutions

Research Projects

- Thematic area: molecular and cell biology
 - Role of gM in KSHV entry, egress and virus-induced cell fusion
 - Development of marine macrolides latrunculins as angiogenesis modulators
 - Regulation of prostate gene expression by 1,3 butadiene
 - The role of chromatin in HSV-1 gene regulation
 - Glucose sensing
 - Cardiomyocyte signaling by cholesterol ozonation products

- Modification of corneal tissue engineered scaffolds to promote epithelialization
- Thematic area: bioinformatics and biocomputing
 - Visual and analytical tools for cluster analysis
 - Gene expression data mining for physiological discovery
 - Large-scale finite element models of the optic nerve head
 - Lacrimal gland bioinformatics: a neural connection of dry eye and aging
 - Neural network-enhanced stereoscopic visualization for interactive analysis of multidimensional biomedical and other data sets

Resources

- Imaging facility
- Genomics facility
- Proteomics facility
- Bioinformatics core facility
- Molecular biology core facility
- Access grid facilities
- Computational facilities

Index Terms

cancer, infectious diseases, bacteria, genomics, proteomics, cell biology, molecular biology, imaging, lung cancer, virus, minority education

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Maine

Comparative Functional Genomics INBRE in Maine

Mount Desert Island Biological Laboratory, Salisbury Cove - P20 RR016463

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Partner Institutions

Bates College, Lewiston
Bowdoin College, Brunswick
Colby College, Waterville
College of the Atlantic, Bar Harbor
The Jackson Laboratory, Bar Harbor

Outreach Institutions

Primary Outreach Institutions

The University of Maine, Orono
University of Maine, Farmington
University of Maine, Machias

Secondary Outreach Institutions

University of Maine, Fort Kent
University of Maine, Presque Island
University of Southern Maine, Portland
Maine Maritime Academy
University of New England

Program Goals

- Augment and strengthen Maine's biomedical research capacity by further developing the collaborative research and training network initiated through BRIN; composed of two research institutions, two undergraduate and graduate degree granting institutions, and three undergraduate degree granting institutions
- Strengthen the lead and partner institutions' biomedical research infrastructure
- Develop a multidisciplinary research program with a scientific focus on comparative functional genomics
- Create expanded opportunities for developing competitiveness for biomedical research funding
- Provide research support and core facilities to junior faculty, postdoctoral fellows, and graduate students at participating institutions
- Create year-round and seasonal research and training opportunities for undergraduate students at participating institutions

- Provide outreach activities to students and faculty at other undergraduate institutions and community colleges in Maine to create a pipeline for students to pursue careers in health research
- Enhance the scientific and technical knowledge of Maine's workforce

Research Projects

- Influence of melatonin on neurite growth and regeneration in crustaceans
- Sequencing and characterization of excitatory glutamate receptors in the freshwater snails *Helisoma trivolvis* and *Biomphalaria glabrata*
- Visualization of compensatory auditory interneuron regeneration
- The dynamics of primary B cell responses in teleost fish
- Identification of novel regulatory sequences in ABCB and ABCC subfamily genes by comparative genomic analysis
- Machine learning methods for phylogenetics and genomics
- Bioinformatics of 3'-UTR-based post-transcriptional regulator elements
- Discovery and characterization of conserved motifs that regulate gene expression during spermatogenesis
- Functional characteristics of regulatory sequences predicted from genomic sequences
- Wnt signaling in the developing gastrointestinal tract
- Dioxin exposure impairs embryonic heart development: comparative expression and promoter analysis of the beta 1-adrenergic receptor
- Mechanisms underlying hyperoxia induced developmental plasticity of respiratory control.

Resources

- Zebrafish facility
- Center for membrane toxicity studies
- Center for marine functional genomic studies
- Animal services core facility
- Bioinformatics core facility
- Cell isolation, culture, and organ perfusion core facility
- Gene expression unit
- Marine DNA sequencing center
- Imaging core facility
- Instrumentation core facility
- Oocyte expression and electrophysiology unit

Index Terms

genomics, proteomics, cell signaling, cell biology, neuroscience, cell development, nerve regeneration, hearing, immune response, reproduction, pollution, cardiovascular disease, gastrointestinal tract, environmental health

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Mississippi

Mississippi Functional Genomics Network

University of Southern Mississippi, Hattiesburg - P20 RR016476

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Partner Institutions

Alcorn State University, Lorman

Millsaps College, Jackson

Mississippi University for Women, Columbus

Tougaloo College, Jackson

Outreach Institutions

Mississippi Valley State University, Itta Bena

Rust College, Holly Springs

Mississippi College, Clinton

Mississippi Gulf Coast Community College, Perkinston

Delta State University, Stoneville

Program Goals

- Develop functional genomics of cancer and of microbial pathogenesis as primary research foci
- Enhance core research facilities in high-throughput genomics, proteomics, cellomics, imaging instrumentation, and bioinformatics, and make them available for use state-wide
- Strengthen biomedical research and training in Mississippi via a multifaceted approach directed toward both faculty and students
- Provide training and mentoring activities through workshops on subjects such as bioinformatics, grant writing and management, publication and presentation, and research techniques
- Prepare a workforce of researchers trained in collection and analysis of massive datasets
- Make the bioinformatics core training tools and software more available through an expanded Web site
- Provide an online clearinghouse for funding opportunities and e-library access to all students and faculty in the state
- Support and mentor eight promising faculty researchers at the partner undergraduate institutions
- Establish experienced scientists as mentors to facilitate development of independent research projects at partner undergraduate institutions

- Enhance undergraduate science training at outreach colleges through summer research awards and workshops

Research Projects

- Thematic area: functional genomics of cancer
 - The molecular biology of lung cancer
 - Proteomics of cytokine induction in tumor cells
 - Cell cycle regulation in *Aspergillus*
- Thematic area: functional genomics of microbial pathogenesis
 - Molecular biology of multi-drug adaptation in *Mucor*
 - Functional genomics of IcsA, a pathogenic determinant in *Shigella*
 - Molecular analysis of ranaviruses
 - Functional genomics of viral oncogenesis in Marek's disease

Resources

- Imaging facility
- Genomics facility
- Proteomics facility
- Cellomics facility
- Pharmacogenomics facility
- Bioinformatics core facility
- Animal facility
- Molecular biology core laboratory

Index Terms

cancer, infectious diseases, bacteria, genomics, proteomics, cell biology, molecular biology, imaging, lung cancer, Marek's disease, virus, minority education

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Montana

Montana Network of Biomedical Research Excellence Montana State University, Bozeman - P20 RR016455

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Partner Institutions

Rocky Mountain College, Billings
Montana State University, Billings
Montana Tech of The University of Montana, Butte
University of Montana - Western, Dillon
Montana State University - Northern, Havre
McLaughlin Research Institute, Great Falls
NIH Rocky Mountain Laboratories, Hamilton
University of Montana

Outreach Institutions

Little Big Horn College, Crow Agency
Stone Child College, Rocky Boy Agency
Blackfeet Community College, Browning
Chief Dull Knife College, Lame Deer
Fort Belknap College, Harlem
Fort Peck Community College, Poplar

Program Goals

- Establish Montana as a leader in research on the epidemiology and pathogenesis of infectious diseases and environmentally-related health issues
- Develop a Montana workforce to meet the biomedical research and economic development challenges of the future
- Increase the number of researchers at undergraduate institutions in the research themes to achieve a sustainable, productive, and competitive research network
- Elevate the research programs at the lead institution to cutting-edge science
- Develop an educational pipeline to careers in health research with expanded research opportunities for students
- Enhance scientific education and offer opportunities to participate in environmental health research for students at the state's Tribal colleges

Research Projects

- Genetic analysis of biofilm formation in *Candida*
- Characterizing the secretory pathway of *Candida albicans*
- Understanding environmental factors in human risk to SNV
- Factors affecting hantavirus transmission
- Novel anti-infectious agents from mine waste microbes
- Prion protein conversion in chronic wasting disease
- Inhibition of fungal amine oxidases
- Health risks from environmental contamination
- Mycobacteriophage characterization
- Isolation of molecules that inhibit pathways regulating cell polarity in yeast

Resources

- Proteomics facility
- Genomics and laser microdissection facility
- Molecular neuroscience core facility
- Advanced confocal imaging facility
- Supercomputer center
- Veterinary molecular biology laboratories
- Center for computational biology data analysis facility
- Center for biofilm engineering facilities
- Bioinformatics research and training laboratory
- Environmental chemistry laboratory
- Electron microscopy facility

Index Terms

epidemiology, pathogenesis, infectious diseases, environmental health, Internet2, *Candida*, hantavirus, biodefense, antibiotics, prion diseases, neuroscience, biofilms, minority education, women's health, water quality, mycology, bioinformatics

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Nebraska

Nebraska Research Network in Functional Genomics University of Nebraska Medical Center - P20 RR016469

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Partner Institutions

Creighton University College of Arts and Sciences
Creighton University Medical Center, Omaha
Doane College, Crete
Nebraska Wesleyan University, Lincoln
University of Nebraska - Kearney
University of Nebraska - Lincoln
University of Nebraska - Omaha
Wayne State College

Outreach Institutions

Chadron State College, Chadron
Little Priest Community College, Winnebago
Midlands Lutheran College
Western Nebraska Community College, Scottsbluff

Program Goals

- Establish a multidisciplinary research network with scientific themes of cell signaling, infectious disease, and neuroscience
- Build and increase Nebraska's research base and capacity
- Provide research opportunities for undergraduate students and serve as a pipeline for students to enter health research careers
- Promote research collaborations
- Provide outreach to underrepresented minority students to bring them into the research enterprise and support disease-specific initiatives
- Enhance the science and technology knowledge of Nebraska's workforce
- Support an emerging biotechnology industry in Nebraska

Research Projects

- Thematic Area: cell signaling
 - Transcriptional regulation of the N-cadherin gene
 - Cell signaling associated with the latent membrane protein (LMP-1) that is involved in EBV infection
 - The Role of Sub2p, a *Saccharomyces cerevisiae* RNA helicase
 - The role of riboswitches in the regulation of gene expression
 - Structural characterization of the cpr gene cluster
 - *Paramecium bursaria* chlorella virus (PBCV-1)
 - Dietary modulation of protein kinase C expression in the intestinal epithelium and its relationship to the development of colon cancer
 - Cell signaling and mechanical properties of individual cells in osteogenesis
 - Microbial inhabitants of Nebraska wetlands
 - Effects of exercise training on remodeling of the diseased heart
- Thematic Area: infectious diseases
 - Interaction between viruses and host cells
 - Characterization of a novel transcriptional suppressor, OTK18
 - Disease resistance response in *Arabidopsis* to infection by turnip crinkle virus
 - Structure and function of internal ribosome entry sites in viral genomes
 - Basis for virulence in high and low virulent strains of *Listeria*
 - Regulation of alginate production in *Pseudomonas*
 - Antimicrobial properties of the anal and oral secretions of carrion beetles
- Thematic Area: neuroscience
 - Neuropeptides in the mouse inferior olivary complex
 - Gene expression during development of the neural crest
 - Traumatic brain injury

Resources

- Molecular modeling core facility
- Bioinformatics core research facilities
- Proteomics facility
- Genetic sequence analysis facility
- Peptide chemistry core facility
- cDNA microarray core facility
- Mouse genome engineering facility
- Mammalian cell culture facility
- Yeast cell culture facility
- Histology facility
- Center for human molecular genetics core laboratories
- Molecular biology core facilities
- Laser-scanning microscope imaging facility
- Flow cytometry core facility

Index Terms

cell signaling, infectious diseases, neuroscience, genomics, proteomics, cancer, colon cancer, bone, bacteria, ecosystems, heart disease, exercise training, myocardial infarction, virus, HIV, immune response, respiratory infections, cystic fibrosis, antibiotics, drug discovery, brain injury, diabetes, minority education

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Nevada

IDEA Network of Biomedical Research Excellence

University of Nevada School of Medicine - P20 RR016464

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Partner Institutions

University of Nevada, Reno
University of Nevada, Las Vegas
Nevada Cancer Institute

Outreach Institutions

Truckee Meadows Community College
Community College of Southern Nevada
Western Nevada Community College
Great Basin College

Program Goals

- Increase the success of Nevada researchers in competing for biomedical grant awards and expand total extramural funding in the state
- Increase the number of multi-investigator, interdisciplinary, and inter-institutional grant awards in Nevada
- Promote the careers of selected target faculty working at the partner institutions through the funding of 2-3 year seed projects, which will allow them to establish their research programs and collect data for subsequent submission of grant proposals
- Promote the development of the new Nevada Cancer Institute by establishing programmatic, training, and shared instrumentation facility linkages with UNSOM, UNR, and UNLV through the INBRE
- Promote bioinformatics research and training at all three research institutions in the network through the further development of the Nevada Bioinformatics Center
- Establish effective assess grid node communications between UNSOM, UNLV, UNR, and NVCI in order to share research seminars, scientific collaboration, and graduate classes among the Nevada institutions and other IDeA state institutions
- Maintain and enhance technology core facilities in genomics, proteomics, cytometry, and imaging that support researchers throughout the state
- Position the Nevada bioinformatics, genomics, and proteomics cores as regional resources for the western IDeA states

- Increase the number of Nevada undergraduates involved in biomedical research and increase the number and quality of Nevada undergraduates entering graduate school and professional schools in health science related fields
- Increase the number of Nevada undergraduates interested in biomedical research careers by improving the effectiveness of our community colleges as feeder institutions for biomedical-related academic majors programs at the universities

Research Projects

- The role of Notch In adult neuroplasticity
- Role of aldose reductase-like-1 In drug resistance
- Senescence signaling through p53
- Novel extracellular proteins in axon guidance
- Ischemia in hibernators
- IL-12 In allogeneic BMT: GVHD and anti-tumor activity

Resources

- Bioinformatics core (sequence analysis and molecular modeling sub-cores)
- Genomics core (high-throughput DNA sequencing and microarrays)
- Proteomics core (high-throughput 2-D gel, MALDI-TOF-TOF MS, LC/MS, 2D-LC/MS, and GC/MS)
- Flow cytometry core
- Imaging core
- Histology core

Index Terms

cell growth and differentiation, cancer, immunology, developmental biology, neurodevelopment, cell signaling, genomics, proteomics, bioinformatics, cytokines, pattern formation, Ischemia, hibernation, senescence, economically disadvantaged, minority education

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New Mexico

New Mexico IDeA Networks of Biomedical Research Excellence New Mexico State University, Las Cruces - P20 RR016480

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Partner Institutions

University of New Mexico, Albuquerque
National Center for Genome Resources, Santa Fe
New Mexico Highlands University, Las Vegas
New Mexico Institute of Mining & Technology, Socorro
Eastern New Mexico University, Portales

Outreach Institutions

San Juan Community College, Farmington
Western New Mexico University, Silver City
University of New Mexico - Gallup
Diné College, Shiprock

Program Goals

- Increase the scope of the science and research cores at the two lead research and educational institutions in New Mexico
- Develop research capacity in the thematic areas of structure and function of biomolecules, complex physiological processes in cells and organisms, and pathogens and infectious disease processes
- Build and enhance the biomedical research base through faculty development
- Establish an outreach program for students at four-year baccalaureate, Tribal and community colleges to foster interest in biomedical research education
- Initiate a partnership with the National Center for Genome Resources for bioinformatics training and research
- Provide interactive communications, technical expertise, and data management and analysis tools to all program participants

Research Projects

- Thematic area: structure and function of biomolecules
 - Protein structure-function in gastric microbial pathogenesis
 - Functions of apolipoproteins in cancer apoptosis
 - NMR investigation of human cksHs1

- Elucidation of the pancratistatin cytotoxic pharmacophore
- Glycosphingolipid-enriched microdomains in cancer cell invasion
- Structural studies on the role of zinc in bacterial proliferation
- ICAM-1 mimics as LFA-1 Inhibitor
- Structural and dynamic analysis of proteins in neuron cell motility
- Thematic area: cell and organism
 - Molecular biology of steroid receptor in *xenopus* oocytes
 - Characterization of Mob1 dynamics in living cells
 - To investigate the pharmacology of the mushroom bodies
 - Gene expression patterns during spermatogenesis
 - Markers of prostate cancer progression: a telomere-based proteomic approach
- Thematic area: pathogens
 - Regulation of multi-drug resistance in *staphylococcus aureus*
 - Evolutionary consequences of dengue virus emergence
 - Investigation of degradative enzymes found in bacitracin
 - Bacterial antibiotic resistance in agriculture

Resources

- Structure and function core facilities
- Cell and organism culture core facility
- Analytical equipment center
- Mass spectrometry core facility
- Bioinformatics core facility

Index Terms

biomolecules, hypertension, memory, cell division, reproduction, pathogens, immunology, inflammation, biodefense, cell biology, organismal biology, antibiotics, cancer, drug resistance, bacteria, dengue fever, *Staphylococcus* infection, minority education, cardiovascular disease, infectious diseases, zinc, gene expression, prostate cancer markers, spermatogenesis, ICAM-1, neuron cell motility

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North Dakota

North Dakota INBRE: Health and the Environment

**University of North Dakota School of Medicine and Health Sciences,
Grand Forks - P20 RR016471**

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Partner Institutions

North Dakota State University, Fargo
Dickinson State University, Dickinson
Mayville State University, Mayville
Minot State University, Minot
University of Mary, Bismarck
Valley City State University, Valley City

Outreach Institutions

North Dakota Association of Tribal Colleges, Bismarck
Turtle Mountain Community College, Belcourt

Program Goals

- Build biomedical research capacity in North Dakota by serving research universities, baccalaureate institutions, and Tribal colleges in the state
- Initiate competitive, sustainable research programs at six predominantly undergraduate institutions (PUIs)
- Increase the number of students from PUIs who choose to pursue advanced training in the biomedical sciences
- Empower Tribal colleges to strengthen their introductory science curricula to increase the number and level of preparation of Tribal college students transferring to four-year science programs
- Enhance bioinformatics core facilities to provide computational resources and increase state-wide access to electronic resources for biomedical research
- Enhance existing proteomics and biology core facilities at the research universities to make them sustainable and effective training and service centers for the scientific network
- Develop research programs at the PUIs, with a thematic research focus in health and the environment; with three sub-themes: pesticides and non-mammalian biomarkers; nutrition, growth, and development; and genetic factors

Research Projects

- Thematic area: pesticides and non-mammalian biomarkers
 - Functional genomics of endocrine disruption
 - Determining aquatic bioindicators for atrazine
 - Effect of MCPA, 2,4 D and bromoxynil on lung development
 - Discovery and development of new anti-fungal drugs
- Thematic area: nutrition, growth and development
 - Copper deficiency and ocular health
 - Anticancer mechanisms of lycopene action
 - Novel fluorescence methods for biomedical applications (overlaps with genetic factors research theme)
- Thematic area: genetic factors
 - Analysis of MLL translocations and fusion genes
 - Genetic polymorphisms and pre-eclampsia

Resources

- Bioinformatics core facilities
- Proteomics core facility
- Cell biology center
- Nucleic acid analysis facility
- Biology core facility with DNA analysis, cell biology, tissue culture, and bioassay instrumentation

Index Terms

cancer, drug discovery, environmental health, molecular biology, toxicology, genomics, anti-fungal drugs, eclampsia, pregnancy, eyes, pesticides, lungs, lycopene, tomatoes, nutrition, anti-carcinogens, copper deficiency, hormones, minority education, women's health

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Oklahoma

Oklahoma IDeA Network of Biomedical Research Excellence

University of Oklahoma Health Sciences Center, Oklahoma City - P20 RR016478

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Partner Institutions

Oklahoma Medical Research Foundation, Oklahoma City
Southwestern Oklahoma State University, Weatherford
Southeastern Oklahoma State University, Durant
Northeastern State University, Tahlequah and Broken Arrow Campuses
Cameron University, Lawton
Langston University, Langston
University of Central Oklahoma, Edmond
University of Oklahoma - Norman
Oklahoma State University, Stillwater

Outreach Institutions

University of Tulsa, Tulsa
Oklahoma City Community College, Oklahoma City
Redlands Community College, El Reno
Comanche Nation College, Lawton

Program Goals

- Build capacity for biomedical research in Oklahoma by supporting promising new faculty, recruiting students into biomedical research careers, and sustaining vital core facilities
- Create a network of institutions that perform biomedical research, teach, and provide patient care; this network includes a historically Black college, a Tribal college, and several other institutions with large enrollments of students from underrepresented minority groups
- Develop research strengths in the thematic areas of microbiology and immunology, cancer, and neuroscience
- Enhance opportunities for investigators at the lead institutions and partner undergraduate institutions to develop independent research programs
- Encourage and mentor participating investigators to develop new NIH grant applications within eighteen months
- Provide summer internships for students to participate in faculty research projects and enroll in new educational programs in bioinformatics and genomics
- Support core facilities in functional genomics and bioinformatics

- Develop a new core facility for functional magnetic resonance imaging in animal research to support statewide research initiatives in cancer and neuroscience

Research Projects

- Analysis of icIL-1 Ra1 and NAG interactions
- Estrogen regulates cytokine expression in the cerebellum
- Osmoadaptation in *Pseudomonas aeruginosa*
- Immunological and photophysical interactions for cancers
- Biosynthesis of isoflavonoid and flavonoid nutrients
- Allosterism in *Escherichia coli* carbamoyl phosphate synthetase
- The role of MMS19 in DNA repair and transcription
- Antioxidant inhibition of gliomas: MRI/MRS evaluation
- Regulation of mismatch repair in *Streptococcus pyogenes*

Resources

- Molecular biology resource center
- Flow and image cytometry laboratories
- Genomics support core facility
- Medical glycobiology center
- Laboratory for macromolecular crystallography
- Laser mass spectroscopy facility
- Animal care facilities
- Imaging facility
- BIACORE core facility
- DNA sequencing facility
- Microinjection core facility
- Protein expression core facility
- Microarray core facility

Index Terms

microbiology, immunology, cancer, neuroscience, genomics, bacteria, estrogen, nutrition, *Streptococcus*, women's health, brain, minority education

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Puerto Rico

Advancing Competitive Biomedical Research in Puerto Rico University of Puerto Rico, San Juan - P20 RR016470

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Partner Institutions

University of Puerto Rico School of Medicine, San Juan
Universidad Central del Caribe, Bayamon
University of Puerto Rico - Rio Piedras Campus
University of Puerto Rico - Humacao Campus
Ponce School of Medicine
University of Puerto Rico - Mayaguez Campus
Universidad Metropolitana, San Juan
University of Turabo, Gurabo
Inter American University of Puerto Rico - Bayamon

Outreach Institutions

Pontifical Catholic University of Puerto Rico, Ponce
Universidad del Este, Carolina
Carlos Albizu University, San Juan
Inter American University of Puerto Rico - Metropolitan Campus, Rio Piedras
University of Puerto Rico - Bayamon
University of Puerto Rico - Cayey Campus

Program Goals

- Strengthen the scientific infrastructure and research competitiveness of Puerto Rico by creating the Alliance for the Advancement of Biomedical Research Excellence
- Develop research strengths in the areas of neuroscience, drug design and delivery, and molecular medicine
- Elevate the productivity, competitiveness, and number of human resources needed to attract established investigators in these key research areas
- Promote the development of research skills of talented junior investigators and gifted students
- Establish an administrative core, bioinformatics core, research core, and outreach core to promote the activities in the research areas
- Provide access to technical expertise and data analysis tools for researchers through their high performance computing facility
- Support key resources through a DNA sequencing and multilocus genotyping facility, a proteomics facility, and an access to biomedical electronic scientific informatics project

- Create programs for junior researchers, graduate and undergraduate students to support research and professional development

Research Projects

- Thematic area: neuroscience
 - Localization of substance P and acetylcholine in the pathway mediating mucociliary activity
 - New methodologies for the synthesis of amino derivatives as nicotinic receptor agonists (also within drug design and delivery research theme)
- Thematic area: drug design and delivery
 - DNA interaction and mutational activity of novel benzazolo[3,2-a] quinolinium salts anticancer drugs
 - Potentially bioactive metabolites from tropical fungi
 - Synthesis, characterization, anticancer activity and reactivity toward biological targets of new platinum (II) complexes
 - Photosensitized reduction and DNA alkylation of alkylating quinones and nitroarenes
 - Study of the underlying factors that shape enzyme properties in organic solvents
 - Molecular studies of proteins encapsulated in soft materials
- Thematic area: molecular medicine
 - Identification and expression analysis of ABC genes in *Plasmodium yoelii*
 - Cell cycle changes in the galactosemic lens
 - Photochemistry and bioactivity of polycyclic aromatic hydrocarbons adsorbed on model surfaces

Resources

- High performance computing facility
- DNA sequencing and multilocus genotyping facility
- Proteomics facility
- Zoological museum
- Herbarium and greenhouse
- Animal care facility
- Microarray facility
- Molecular biology and gene characterization facilities
- Tissue and cell culture facilities
- NMR facility
- Biotesting facility
- Laser and spectroscopy facility
- X-ray crystallography facility
- Mass spectrometry facility
- Surface microscopy and spectroscopy facility
- Time resolved-resonance Raman spectroscopy facility
- Automated synthesis and sequencing facility
- Molecular neurobiology laboratory
- Caribbean Primate Research Center
- Visualization laboratory
- Flow cytometry facility

Index Terms

neuroscience, drug design, drug delivery, molecular medicine, genomics, proteomics, eyes, cancer, anticancer drugs, biotechnology, malaria, drug resistance, cataract, hyperglycemia, tuberculosis, carcinogens, pollutants, asthma, sinusitis, cystic fibrosis, bronchitis, artificial blood, minority education, environmental health

Rhode Island

Rhode Island Network for Molecular Toxicology

University of Rhode Island, Kingston - P20 RR016457

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Partner Institutions

Brown University, Providence
Roger Williams University, Bristol
Salve Regina University, Newport
Rhode Island College, Providence
Providence College, Providence

Outreach Institutions

Community College of Rhode Island, Warwick
Bryant College, Smithfield
City Campus, Providence

Program Goals

- Develop research capacity at the doctoral degree granting and baccalaureate institutions in Rhode Island
- Enhance the capacity of junior investigators to compete for extramural research funds for individual or collaborative projects
- Build a productive, collaborative research program in molecular toxicology
- Train a cadre of undergraduate and graduate students in research instrumentation and methodology for careers in the biomedical sciences
- Maintain and provide inclusive access to state-of-the-art analytical instrumentation through a centralized research facility core
- Establish an effective outreach program for recruiting, training, and mentoring underrepresented scientists and students
- Assist investigators with data mining, data processing, and molecular modeling needs through development of bioinformatics core resources
- Organize seminars and workshops on topics of mutual interest to Network participants

Research Projects

- Methyl tertiary-butyl ether caused testicular injury
- Growth control in the testis and molecular mechanisms of testicular homeostasis in toxicant-induced testicular injury
- Molecular and biochemical characterization of a secreted lipase in *Leishmania*
- Role of the antizyme family during *Xenopus* development
- Cell signaling leading to UV-induced cell injury
- Heavy metal-induced alteration of cardiovascular development
- Genome stability through bloom syndrome helicase and Rad51 complex formation
- *E. histolytica* EhADH2 enzyme as anti-amoebic target
- Genetic and molecular analysis of aging and apoptosis in the yeast, *Saccharomyces*
- The role for the aryl hydrocarbon receptor in netrin-1 signaling
- Nanomaterial-based bioelectronic detection of disease markers
- Characterization of pyrethroids on sperm voltage-sensitive calcium channels
- Mercury contaminants in commercial and recreational finfish of Narragansett Bay, Rhode Island

Resources

- Centralized research facility core, with equipment for mass spectrometry, flow cytometry, microarray gene chip scanning, protein chip technology, 2-D electrophoresis with spot picking and digestion, gel scanning, protein sequencing, chromatography, fluorescence and light microscopy, spectropolarimetry, fluorescence spectroscopy, UV-visible spectroscopy, radioactivity detection, trace element analysis, centrifugation, cell culture, and other molecular and cell biology applications
- DNA sequencing facility
- Animal care facility
- NMR facility
- Electron microscopy facilities
- Zebrafish breeding colony
- Molecular modeling core facility
- Transgenic mouse facility

Index Terms

toxicology, environmental health, cell biology, proteomics, genomics, cancer, mutagenesis, male reproductive health, *Leishmania*, heavy metals, pesticides, Ah receptor, cell signaling, skin cancer, ultraviolet radiation, nanotechnology, biomarkers, minority education, undergraduate research

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South Carolina

South Carolina IDeA Networks of Biomedical Research Excellence University of South Carolina - P20 RR16461

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Partner Institutions

Comprehensive Research Universities
Clemson University, Clemson
Medical University of South Carolina,
Charleston
University of South Carolina, Columbia

Primarily Undergraduate Institutions
Claflin University, Orangeburg
College of Charleston, Charleston
Furman University, Greenville
Winthrop University, Rock Hill

Outreach Institutions

Allen University
Anderson University
Benedict College
Bob Jones University
Charleston Southern University
Coker College
Columbia College
Converse College
The Citadel

Coastal Carolina University
Erskine College
Francis Marion University
Lander University
Limestone College
Morris College
Newberry College
Presbyterian College
Southern Wesleyan University

South Carolina State University
University of South Carolina -
Aiken
University of South Carolina -
Beaufort
University of South Carolina -
Upstate
Voorhees College
Wofford College

Program Goals

- Develop South Carolina's biomedical research capacity through support of multi-disciplinary, multi-institutional and complementary research programs in the thematic area: *Regenerative Medicine*, including biomaterials, tissue engineering, and stem cell technology
- Develop research and educational programs for undergraduate students in the related disciplines of biochemistry, bioengineering, biotechnology, and cell, molecular, and developmental biology
- Strengthen the network of inter-institutional research collaborations established under BRIN
- Recruit faculty, postdoctoral fellows, and technical personnel, to build capacity and strengthen infrastructure for biomedical research
- Acquire state-of-the-art instrumentation and develop core facilities for support of biomedical research
- Provide effective mentoring for target faculty to promote their success in biomedical research
- Engage undergraduate students in research throughout their academic careers as a mechanism to enhance their interest and competence in biomedical research
- Reach out to minority faculty and students at academic institutions throughout the state in order to involve them in productive biomedical research experiences

- Develop statewide bioinformatics capacity, with emphasis on training programs, distribution of software resources, and access to hardware
- Provide a range of programs reaching out to all primarily undergraduate institutions throughout the state, with emphasis on research seminar programs, undergraduate research experiences, and minority outreach initiatives

Research Projects

- Effects of mechanical force on tissue development, morphology, and function
- Cardiovascular biomaterial design and characterization
- Development of stem cell single cell engraftment model
- Mechanisms of angiogenesis during development and cancer
- Extracellular matrix receptor responses to changes in matrix organization
- Mechanics at interface of fibroblasts & myocytes and extracellular matrix
- Angiogenesis and capillary permeability in atherosclerotic lesions
- Mechanisms regulating stem cell migration and recruitment to target tissue
- Elastin stabilization in cardiovascular biomaterials
- Endothelial cell response-guided design to hyaluronan vascular grafts
- Mechanism of platelet adhesion to adsorbed fibrinogen
- Viral and host cell determinants of HPV integration and transformation
- Role of biofilms in development of colon cancer
- Projectin, a scaffold for myofibril assembly in *Drosophila*
- *Drosophila* as a model for Batten disease
- Molecular analysis of circadian rhythms
- Structural studies of non-heme metalloenzyme intermediates
- Structural and synthetic studies on the antibiotic cyclosporin E
- β -endorphin modulation of the effects of alcohol
- Pro- and anti-estrogenic activities of aryl hydrocarbon receptor ligands
- Design of novel N-acyl-phenethylamides that selectively kill cancer cells
- Hydration effects on sequence specific DNA recognition
- PARS, serine proteases and serpins in axon growth and synaptogenesis
- Stem-cell augmented repair in a bioengineered cardiac model
- Role of thrombomodulin in prostate cancer-associated angiogenesis
- Single molecule studies on metal-ion-induced conformational changes
- Interaction of complement component C8 α and adiponectin receptor I
- Mapping of HMBA1 binding domains mediating tumor transformation
- Hepatitis B virus: adaptive evolution of immune recognition and evasion

Resources

- Cardiovascular biomaterials core
- Stem cell research and technology core
- Proteomics core laboratory
- Microinjection core facility
- Microscopy, morphology, and imaging core
- South Carolina Center for Biotechnology (DNA sequencing)
- Biomolecular computing and modeling center

Index Terms

regenerative medicine, bioengineering, biomaterials, cardiovascular disease, tissue engineering, stem cell biology, angiogenesis, extracellular matrix, metalloproteins, neuroscience, cancer therapy, virus-host interactions, proteomics and genomics, bioinformatics

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South Dakota

South Dakota Biomedical Research Infrastructure Network University of South Dakota, Vermillion - P20 RR016479

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Partner Institutions

University of South Dakota School of Medicine, Vermillion
Augustana College, Sioux Falls
Black Hills State University, Spearfish
Dakota Wesleyan University, Mitchell
Mount Marty College, Yankton
University of Sioux Falls, Sioux Falls

Outreach Institutions

Sisseton-Wahpeton College, Agency Village
Sinte Gleske University, Mission
Oglala Lakota College, Kyle

Program Goals

- Continue to develop a strong collaborative network within South Dakota to enhance basic biomedical research capabilities
- Foster interdisciplinary research in the control of cell growth, with special emphasis on proteomics and genomics
- Enhance research capacity and critical mass of investigators through mentorship of junior investigators at the lead institution
- Maintain professionally staffed core facilities in proteomics and genomics for use by investigators throughout the state
- Provide increased opportunities for graduate training in the core disciplines
- Provide research support and mentoring for junior investigators and faculty from partner institutions
- Provide training and research opportunities for students at predominantly undergraduate institutions
- Introduce undergraduate students to graduate programs and career opportunities in biomedical sciences and bioinformatics

- Foster interest in further education and careers in science and research for students at Tribal colleges through enhancement of their science education programs and provision of research opportunities

Research Projects

- Human papilloma virus in a Native American population
- Role of HtrA in expression of virulence factors in *Streptococcus pyogenes*
- Sustained reduction in mean arterial blood pressure following early transient inhibition of renin-angiotensin system in spontaneously hypertensive rats
- Androgens and the corpus luteum
- Regulation of protein translation by ATM in response to insulin
- Host-virus interactions: ranid herpesvirus-1 and the northern leopard frog, *Rana pipiens*
- The pursuit of novel ionophoric macromolecules based upon 3,4-linked tetrahydrofurans
- Scanning the wheat genome for genes regulating the expression of the genes in the starch biosynthetic pathway
- Systemin and the octadecanoid pathway
- Lipid-based signaling in plants and animals
- Bacterial oxidation of ammonia and methane
- Bacterial succession in specialized habitats
- Statistical and computational support of biology faculty research projects
- The development of a research program in the evolutionary genetics of the genes responsible for transmissible spongiform encephalopathies
- Gene expression in biologically meaningful contexts: functional genomics in close wild relatives of the model organism *Arabidopsis thaliana*
- Investigation of new kainic acid derivatives
- Obesity, leptin, resistance, and reproductive function in the lethal yellow mouse
- Molecular epidemiological studies of methicillin resistant *Staphylococcus aureus*

Resources

- Proteomics core facility
- Genomics core facility
- Animal care facility
- DNA sequencing and genotyping core facility
- Fluorescence-activated cell sorting core facility
- Microscopy core facility
- Digital imaging core facility

Index Terms

cell growth, proteomics, genomics, immunology, cell signaling, bacteria, environmental biology, herpesvirus, senile dementia, infertility, obesity, encephalitis, prion diseases, *Staphylococcus*, antibiotic resistance, infectious diseases, nutrition, biofuels, genital warts, oncology, cancer, gynecology, *Streptococcus*, toxic shock syndrome, rheumatic heart disease, autoimmune disorders, blood pressure regulation, pregnancy, women's health, reproductive hormones, ataxia-telangiectasia, rare diseases, minority education, cardiovascular disease

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Vermont

Vermont Genetics Network

University of Vermont, Burlington - P20 RR016462

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Partner Institutions

Castleton State College, Castleton
Johnson State College, Johnson
Middlebury College, Middlebury
Norwich University, Northfield
Saint Michael's College, Colchester

Outreach Institutions

Bennington College, Bennington
Burlington College, Burlington
Castleton State College, Castleton
Champlain College, Burlington
Community College of Vermont, Statewide
Green Mountain College, Poultney
Johnson State College, Johnson
Landmark College, Putney
Lyndon State College, Lyndonville
Marlboro College, Marlboro
Middlebury College, Middlebury
Norwich University, Northfield
Saint Michael's College, Colchester
Southern Vermont College, Bennington
Sterling College, Craftsbury Common
University of Vermont, Burlington
Vermont Technical College, Randolph Center

Program Goals

- Build a culture of research at the baccalaureate partner institutions that will be sustained
- Establish an outreach core
- Strengthen the research capacity and critical mass of genetics biomedical researchers at the lead institution, the University of Vermont, as a resource for the entire state
- Assess the progress of the VGN through longitudinal studies

Research Projects

- Physical activity and the rate of force development in older women
- Synthesis of hyaluronic mimetics
- Leukocyte subset responses following different exercise stimuli
- The role of peptide transporters in rice seed germination
- Graph polynomials and DNA structure
- Cytopathic effect of the *Borrelia burgdorferi* exoproteins Oms28 and Enolase
- The Maillard reaction between ribose 5-phosphate and cellular amines and proteins
- The identification and characterization of the mammalian meiotic mutation mei4
- Volatile signaling molecules in *Pharbitis nil*
- Embryonic and age-related expression of AQP4, NHE2, NHE4, AE2, Kir2.1, and KvLQT1 in the mouse

Resources

- Structural biology: x-ray crystallography
- Life science computing center
- COBRE imaging facility
- COBRE molecular biology facility
- Clinical research facility
- Vermont Cancer Center
- UVM/VGN microarray facility
- Animal facility, College of Medicine, UVM
- Bioinformatics core: structural and computational biology computing facility
- UVM Internet2
- Mass spectroscopy facility

Index Terms

genetics, microarray, proteomics, outreach, diversity, cancer, biological sequence analysis, middleware, groupware

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West Virginia

West Virginia IDeA Networks of Biomedical Research Excellence Marshall University School of Medicine, Huntington - P20 RR016477

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Partner Institutions

Alderson-Broaddus College, Philippi
West Virginia University, Morgantown
Charleston Area Medical Center, Charleston
ACoRN Health Clinics:
Lincoln Primary Care Center
Tri-County Clinic
Tug River Clinic
Valley Health Systems
Fairmont State University, Fairmont
West Liberty State College, West Liberty
West Virginia State University, Institute
Wheeling Jesuit University, Wheeling

Outreach Institutions

Bluefield State College, Bluefield
Shepherd College, Shepherdstown
West Virginia Wesleyan College, Buckhannon
Davis and Elkins College, Elkins
Bethany College, Bethany
Concord University, Athens
Glennville State College, Glennville
Mountain State University, Beckley
Salem International University, Salem
University of Charleston, Charleston

Program Goals

- Build on the foundation of the successful network of biomedical research and teaching institutions established in West Virginia through the BRIN Program
- Create a multidisciplinary research theme for this network in cellular and molecular biology, with an emphasis on cardiovascular disease

- Establish a programmatic structure to facilitate the research progress, mentorship and training, and career development, of scientists and students at the network institutions
- Expand the scope of the Appalachian Cardiovascular Research Network (ACoRN) developed during the West Virginia BRIN Program
- Provide research opportunities for undergraduate students that will serve as a pipeline into health-related research careers
- Develop activities to advance the outreach institutions to the level of participation of the partner institutions
- Enhance the science and technology knowledge base of the West Virginia workforce through providing workshops, seminars, research training and mentoring, and access to state-of-the-art core facilities

Research Projects

- Genetic basis for familial hypertriglyceridemia (FHTG)
- Genetic basis for familial hyperlipidemia (FCHL)
- Integrin regulation of cell death in cancer cells
- Dapsone activation of CYP2C9: a molecular modeling study
- Response of vascular smooth muscle cells to stretch
- AFAP-110 as a regulator of angiogenesis
- Signaling pathways in apigenin-inhibiting tumor growth

Resources

- Genomics core facility
- Imaging core facility
- Computational chemistry and modeling laboratory
- Proteomics core facility
- Flow cytometry core facility
- Recombinant DNA core facility
- Image analysis facility
- Animal care facility

Index Terms

cell biology, molecular biology, cardiovascular disease, cancer, proteomics, genomics, imaging, computational chemistry, fat metabolism, genetics

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Wyoming

UW Northern Rockies Regional INBRE University of Wyoming, Laramie - P20 RR016474

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Partner Institutions

Casper College, Casper
Central Wyoming College, Riverton
Northwest Community College, Powell
Sheridan College, Sheridan
Western Wyoming Community College, Rock Springs

Outreach Institutions

Laramie County Community College, Cheyenne
Eastern Wyoming College, Torrington
Northwest College, Powell

Program Goals

- Continue to build on accomplishments achieved as a result of the BRIN Program
- Increase the competitiveness of Wyoming investigators in obtaining funding from NIH within five years
- Develop research in the themes of integrative physiology, fertility and women's health, and health outcomes in rural populations
- Establish a multidisciplinary research network that will build and strengthen biomedical research expertise and infrastructure at the University of Wyoming and its partner institutions
- Provide role models and build links to other institutions by creating a visiting senior scientist program in which well-established, internationally-recognized scientists will spend three to twelve months at the University of Wyoming
- Provide research support to faculty, postdoctoral fellows and graduate students
- Provide additional research and learning opportunities for undergraduates at the University of Wyoming and the network community colleges to create a pipeline for students to continue in health research careers
- Enhance science and technology knowledge of the state's workforce

Research Projects

- Vitamin E, ovarian cancer, and fertility
- Maternal undernutrition programs and fetal heart gene expression
- Identification of signal pathways involved in transmitter-mediated vasopressin release
- Placentomal vascular adaptations to early maternal nutrient restriction in the ewe
- Systems change for community health promotion
- Community-focused health and bio-physiological research
- Maladaptive reorganization of inhibitory circuits in neocortical malformation
- GnRH and hot flashes
- Amino acid infusion on mTOR signaling in fetal muscle under nutrient deficiency
- A natural model for study of chronic and acute renal failure
- Targeted fast-release nanoparticles for ovarian cancer
- Aberrant integration of mitochondrial functions in human choreoacanthocytosis
- Role of cohesion in apoptotic cell death
- Neurological basis for postpartum depression
- Development of motor control for speech

Resources

- Bioinformatics core facility
- Imaging/ microscopy core facility
- Macromolecular core facility
- Center for rural health research and education

Index Terms

integrative physiology, fertility, women's health, public health, ovarian cancer, cancer, nutrition, genomics, cell signaling, rural health, placental development

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